

REMARKS

Claims 1-8 are pending in this application. Claim 1 has been amended.

Claims 1-3 and 6-8 stand rejected under 35 U.S.C. § 102 as being anticipated by Okazaki et al. (U.S. Patent No. 6,264,827) (“Okazaki”). This rejection is respectfully traversed.

The claimed invention relates to a process for reducing content of sulphur compounds and polyaromatic hydrocarbons in a hydrocarbon feed stock. As such, amended independent claim 1 recites a “process for reducing content of sulphur compounds and polyaromatic hydrocarbons in a hydrocarbon feed stock” by *inter alia* “contacting the feed stock with hydrogen over a hydrotreating catalyst at conditions being effective for hydrotreating and obtaining a hydrotreated effluent” and “cooling the hydrotreated effluent.” Amended independent claim 1 also recites “contacting the hydrotreated effluent with a hydrotreating catalyst at conditions being effective for conversion of polyaromatic hydrocarbons to monoaromatic compounds” and “introducing the hydrotreated effluent from step (c) into an FCC unit for producing gasoline.”

Okazaki relates to a “manufacturing process of a diesel oil with a high cetane number and a low sulfur.” (Abstract). Okazaki teaches that the cetane number is improved “by the ring opening with hydrogenation of the petroleum distillate oil and lowering of the sulfur content by hydrodesulfurization.” (Col. 2, lines 48-52). Okazaki emphasizes that “unstable substances with polycyclic aromatic structures . . . which make worse the storage stability are removed.” (Col. 2, lines 52-55). This is because “[t]he unstable substances with specific polycyclic aromatic structures make the hue of the hydrogenated oil worse and generate sludge.” (Col. 2, lines 55-57).

Okazaki does not disclose all limitations of claims 1-3 and 6-8. Okazaki fails to teach or suggest a “process for reducing content of sulphur compounds and polyaromatic hydrocarbons in a hydrocarbon feed stock” by *inter alia* “contacting the hydrotreated

effluent with a hydrotreating catalyst at conditions being effective *for conversion of polyaromatic hydrocarbons to monoaromatic compounds*” and “*introducing the hydrotreated effluent from step (c) into an FCC unit for producing gasoline*,” as amended independent claim 1 recites (emphasis added). Okazaki teaches improving the cetane number “by the ring opening with hydrogenation of the petroleum distillate oil” and lowering of the sulfur content by hydrodesulfurization. (Col. 2, lines 48-52). Thus, Okazaki teaches ring opening of the petroleum distillate oil and the formation of aliphatic non-cyclic compounds which are *non-aromatic compounds*, and not “*conversion of polyaromatic hydrocarbons to monoaromatic compounds*,” as amended independent claim 1 recites (emphasis added). Okazaki also relates to the production of diesel fuel with a high cetane number, and not to the production of high octane gasoline in an FCC unit, as in the claimed invention. For at least these reasons, Okazaki fails to teach or disclose all limitations of amended independent claim 1, and withdrawal of the rejection of claims 1-3 and 6-8 is respectfully requested.

Claim 4 stands rejected under 35 U.S.C. § 103 as being unpatentable over Okazaki in view of Inwood (US Patent No. 3,691,060). This rejection is respectfully traversed.

Amended claim 4 depends on amended independent claim 1 and recites that the step of “contacting the hydrotreated effluent with a hydrotreating catalyst at conditions being effective for conversion of polyaromatic hydrocarbons to monoaromatic compounds” is “performed in a final catalyst bed of the hydrotreating zone.”

Inwood relates to a method of “hydrogenation of aromatic hydrocarbons.” (Abstract; Title). Inwood teaches that “[a]romatic hydrocarbon feedstock containing organic sulfur compounds are hydrogenated in a ‘single-stage’ process, utilizing a dual-catalyst hydrogenation system.” (Abstract). In this manner, “[t]he feed is first hydrofined over a sulfactive catalyst . . . and total effluent is then hydrogenated over a sulfur-sensitive Group VIII noble metal hydrogenation catalyst.” (Abstract).

The subject matter of amended claim 4 would not have been obvious over Okazaki in view of Inwood. Okazaki and Inwood, whether considered alone or in combination, fail to teach or suggest all limitations of amended independent claim 1. As noted above, Okazaki fails to teach or suggest a “process for reducing content of sulphur compounds and polyaromatic hydrocarbons in a hydrocarbon feed stock” by *inter alia* “contacting the hydrotreated effluent with a hydrotreating catalyst at conditions being effective for conversion of polyaromatic hydrocarbons to monoaromatic compounds” and “introducing the hydrotreated effluent from step (c) into an FCC unit for producing gasoline,” as amended independent claim 1 recites (emphasis added).

Similarly, Inwood fails to teach or suggest the sequence of steps recited in amended independent claim 1. Inwood does not teach or suggest “contacting the feed stock with hydrogen over a hydrotreating catalyst . . . and obtaining a hydrotreated effluent,” “cooling the hydrotreated effluent,” “contacting the hydrotreated effluent with a hydrotreating catalyst at conditions being effective for conversion of polyaromatic hydrocarbons to monoaromatic compounds” and “introducing the hydrotreated effluent from step (c) into an FCC unit for producing gasoline,” as amended independent claim 1 recites. Inwood teaches that the first step requires “hydrofining conditions and catalysts” and that the second step requires “hydrogenation conditions and catalysts,” without an intermediary cooling step. (Col. 3, lines 33-75; Col. 4, lines 1-20). For at least these reasons, the Office Action fails to establish a *prima facie* case of obviousness and withdrawal of the rejection of claim 4 is respectfully requested.

Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Okazaki. This rejection is respectfully traversed.

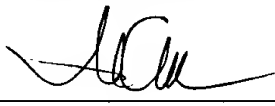
Claim 5 depends on amended independent claim 1 and recites that “the feedstock is characterized by having a 50% boiling point between 300°C and 450°C.” As noted above, Okazaki fails to teach or suggest all limitations of amended independent claim 1. Accordingly, withdrawal of the rejection of claim 5 is respectfully requested.

A marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made to claims."

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Twice Amended) A process for reducing content of sulphur compounds and polyaromatic hydrocarbons in a hydrocarbon feed stock having a boiling range between 200°C and 600°C, which process comprises the steps of:

(a) contacting the feed stock with hydrogen over a hydrotreating catalyst in a hydrotreating zone at conditions being effective for hydrotreating and obtaining a hydrotreated effluent comprising hydrotreated feed stock, hydrogen sulphide and hydrogen;

(b) cooling the hydrotreated effluent; [and]

(c) contacting the hydrotreated effluent with a hydrotreating catalyst at conditions being effective for conversion of polyaromatic hydrocarbons to monoaromatic compounds; and

(d) introducing the hydrotreated effluent from step (c) into an FCC unit for producing gasoline.